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growth of the "tentacles" (?) in Aurelia to form the "mouth opening," and the statement of the position of the eyes. The obscurity comes from the use of the word fringed as applied to the edges of the "mouth opening" and the margin of the disk. The sense organs of Aurelia have no connection with the walls of the "mouth opening." I find no authority for the statement that the "square mouth opening" in *Aurelia flavidula* is formed by the union of four "tentacles." I have also studied the live ephyra of Cyanea and Aurelia, and find no such method of formation of the mouth in these genera.

It is to be regretted that the splendid memoirs of Eimer and the Hertwigs could not have been quoted at greater length. Much, of course, had to be omitted to prevent the book assuming undue proportions The discovery by the latter that the otolith of the Trachynemidæ is endodermic, while that of the free medusa of the Campanularians is ectodermic, is one of their most important discoveries, and should be mentioned.

The statement on page 62 by which the "Discophora" are made to differ from the Hydromedusæ "in developing directly from eggs," and that on page 68 that *Pelagia* ("*campanella*" ?) *cyanella* does not undergo a metamorphosis but "grows directly from the eggs" would leave one unfamiliar with the embryology of these animals in doubt as to what is meant by a direct development from the egg. Pelagia differs from Aurelia in that it never passes through an attached strobila stage.

In view of the elasticity of the word homology in recent times, one is not surprised to find the foot of a mollusk compared to the under lip of a worm (?), or *vice versa* (p. 12). It is doubtful whether such a comparison would be accepted by all naturalists, and questionable whether it should be introduced as an illustration of the term in a text book. The term homology, like many others (polymorphism, individual, &c.) is yet to be accurately defined in a manner acceptable to all. At present there is no better illustration of the term than the old comparison of the wing of the bird and the arm of man.—*J. W. F.*

STUDIES FROM THE MORPHOLOGICAL LABORATORY IN THE UNIVERSITY OF CAMBRIDGE.[1]—This thick brochure is mostly taken up with embryological papers which have appeared during the past year in the Quarterly Journal of Microscopical Science and the Proceedings of the Cambridge Philosophical Society. The papers relate mostly to the special points in the development of the Vertebrates. The first paper relates to the existence of a head-kidney in the embryo chick together with some points in the development of the Müllerian duct. In this paper Messrs. Balfour and Sedgwick record the existence of certain structures in the embryo chick, which eventually become in part the abdominal opening of the Müllerian duct, and which correspond with the head-kidney, or "vorniere" of German authors; they also conclude that the Müllerian duct does not develop entirely independently of the Wolffian duct; and finally the authors discuss certain rectifications in the views of the homologies of the parts of the excretory system in birds, necessitated by the results of their investigations.

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[1] Edited by F. M. Balfour, M.A., F. R. S., Williams and Norgate, 1880. 8° pp. 109. 10 plates.

In the second paper Mr. Balfour traces the early development of the lizards, and discusses the nature and relations of the primitive streak. He also shows in the third paper that the nervous cords of Peripatus are minutely ganglionated, and are not simple nervous threads as heretofore supposed.

Messrs. Scott and Osborn's paper on the early development of the common newt of England we have elsewhere noticed. The fifth paper is by Mr. Adam Sedgwick, on the development of the kidney in its relation to the Wolffian body in the chick. Although considerable good work has been done on the embryology of the spiders, Mr. Balfour has worked out additional points of much interest in his paper on the development of the Araneina. Among these he has proved that the supra-œsophageal ganglion of the adult is the result of the fusion of what in the embryo are two separate ganglia, and he thus effectually settles the question as to whether the first pair of appendages, the mandibles, represent the antennæ of the insects and myriopods, since he demonstrates that the nerves to these appendages are sent from what is originally the second pair of nervous ganglia, thus showing that the antennæ are morphologically as well as functionally absent.

The view at one time prevalent, that the Arachnida are as nearly related to the Crustacea as to the insect, is not sustained by the facts brought out by Mr. Balfour, who states that "such differences as there are between insects and Arachnida sink into insignificance compared with the immense differences in the origin of the mesoblast between either group, and that in the Isopoda, or still more the Malacostraca and most Crustacea." Farther on he says, "In the formation of the alimentary tract, again, the differences between the Crustacea and Tracheata are equally marked, and the Arachnida agree with the Tracheata." This is confirmatory of the view taught by Leuckart, Agassiz, and insisted upon by others, that the Arachnida and insects (Hexapoda) as well as myriopods belong to a class, Insecta or Tracheata, as opposed to the Crustacea or gill-bearing Arthropods, which may, with Gegenbaur, be called Branchiata.

The seventh and last paper, by Mr. Adam Sedgwick, treats of the development of the structure known as the "glomerulus of the head-kidney" in the chick. This has been found to be "nothing more than a series of glomeruli of primary Malphigian bodies projecting through the wide openings of the segmental tubes into the body-cavity."

THE HESSIAN FLY.[1]—The object of this and several of the Bulletins issued by the Entomological Commission is not so much to show evidence of special and new field studies or for the display of entomological learning, as to set forth well-known facts regarding the more injurious insects and the best means of combating them, and to place the results in the hands of those most interested, *i. e.*, the farmers. The Bulletins so far issued by the Department of the Interior, have rapidly gone out of print, and fresh editions furnished either by the Department or by Congress. It was contemplated to issue others, and this could have been done, with little expense to the country and without detriment to the objects for which the Entomological Commission was working, *i. e.*, the thorough investigation of the locust plague and the depredations of the cotton-worm; but such a design was considered unlawful and nefarious by the Commissioner of Agriculture, and every effort was made by that enlightened official, aided by his entomologist, to not only stop the issue of such bulletins as the one before us, but to extinguish the Commission outright. While Congress voted larger appropriations than ever before to the Commission, the immediate result of Gen. Le Duc's labors was to restrict the labors of the Commission for the coming year to the locust and cotton-worm. All this is directly in the line pursued by some of our former agricultural commissioners, and evinces the wisdom of political appointments, *i. e.*, of ex-judges and railroad contractors, for a position which could be made one of great importance and usefulness if worthily filled.

The plate[2] reproduced gives an idea of the Hessian fly and its transformations, and its chief parasite, the *Semiotellus destructor.* Not much, though some new matter has been added to what was previously known as to the habits of this insect or the remedies against its attacks, but the chronological table of years of abundance of the Hessian fly, may prove of interest as well as the bibliographical list.

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[1] *Department of the Interior. U. S. Entomological Commission. Bulletin No. 4. The Hessian Fly, its Ravages, Habits, Enemies and means of preventing its increase.* By A. S. PACKARD, Jr. Washington, May 20, 1880. 8vo, pp. 43.

[2] EXPLANATION OF THE PLATE.—A healthy stalk of wheat on the left, the one on the right dwarfed and the lower leaves beginning to wither and turn yellow; the stem swollen at three places near the ground where the flaxseed (*h*) are situated, between the stem and sheathing base of the leaf. *a*, egg of the Hessian fly (greatly enlarged, as are all the figures except *e* and *h*). *b*, the larva, enlarged, the line by the side, in this and other figures, showing the natural length. *c*, the flaxseed, puparium or pupa case. *d*, the pupa or chrysalis. *e*, the Hessian fly, natural size, laying its eggs in the creases of the leaf. *f*, female Hessian fly, much enlarged. *g*, male Hessian fly, much enlarged. *h*, flaxseed between the leaves and stalk. *i*, chalcid or ichneumon parasite of the Hessian fly, male, enlarged.